

5,365,278
5,341,442
5,218,432

Willis
Barrett
Wakeland

Neither Roskowski et al. U.S. Patent No. 5,257,348 nor Roskowski et al. U.S. Patent No. 5,274,753 disclose or suggest a multi-format frame buffer in which both RGB and YUV data can be simultaneously stored in their original formats. In the Roskowski references, all YUV data is converted in RGB data before delivery to the frame buffer. Additionally, all data, RGB or YUV after conversion, is stored in a single 8:8:8 RGB format. Additionally, neither of the Roskowski et al. references discloses dual backend pipelines for respectively processing graphics and video data retrieved from the frame buffer.

Maietta et al., U.S. Patent No. 5,229,852, discloses a scan converter which also uses a "flat" frame buffer in which all pixels are stored in the same format; Maietta et al. does not disclose or suggest a frame buffer which stores data in different formats simultaneously. Further, Maietta et al. does not disclose first and second pipelines on the output of the frame buffer for respectively processing graphics and video data.

Sanders, U.S. Patent No. 4,991,122, discloses techniques for mapping video data from a frame buffer to a display monitor. The frame buffer in Sanders only stores YUV data which may be converted into RGB data only after retrieval from the frame buffer. Sanders also does not show a pair of output pipelines for separately processing graphics (RGB) and video (YUV) data retrieved from the single frame buffer.

Willis, U.S. Patent No. 5,365,278, discloses a video display system (i.e., television). Willis does not disclose a unified frame buffer holding both RGB and YUV simultaneously. Sanders also does not employ parallel graphics and video pipelines for processing data output from such a unified frame buffer. In Sanders, YUV to RGB conversion is performed at the very backend of a single YUV (video) pipeline.

Balkanski et al., U.S. Patent No. 5,341,318, discloses a display system operating on both RGB and YUV data. The Balkanski et al. system employs a flat frame buffer with all data stored therein represented in a YUV format. Incoming RGB data is converted to YUV. Only a single pipeline handling YUV data is provided at the output of a block memory unit.

Barrett, U.S. Patent No. 5,341,442, discloses compression methods for YUV data. Barrett does not disclose a unified frame buffer storing both YUV and RGB simultaneously. Further, Barrett does not disclose parallel backend processing of both RGB and YUV data. In the Barrett system, RGB image data is converted to YUV data prior to compression processing and then reconverted to RGB data before delivery to the display.

Wakeland, U.S. Patent No. 5,218,432, discloses a system for merging video signals received from multiple sources. Wakeland does not disclose a unified frame buffer storing both graphics and video formatted data simultaneously. Wakeland also does not disclose parallel backend pipelines for separately handling graphics and video data. In Wakeland, a first YUV data is operated on by a VGA controller and then sent to a color palette

for conversion into RGB. A second stream of YUV data is operated on by an advanced video board and the color palette. In each case, the YUV format should be the same (col. 7, line 33).

For the foregoing reasons, Applicants submit that the claims of the present application are allowable over the references listed above. If the Examiner has any questions or comments, the Examiner is invited to call the undersigned at 214-745-5374.

Copies of the references cited in the attached PTO-1449 are enclosed.

Respectfully submitted,
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Date of Signature